

L Number	Hits	Search Text	DB	Time stamp
-	6	("6321212" "6321205" "6393406").pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 15:59
-	2	5615109.pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 10:46
-	91	("6321212" "6321205" "6393406" "6061662" "6061662" "6411936" "6317700" "6173276" "6456982" "5812988" "6035287" "5692233" "5799287" "5946667" "6092056" "6125355" "6167384" "6192347" "6266655" "5905975" "6021398" "5983207" "4912332" "6216115" "6216115" "5802499" "5950179" "5805155" "6370423" "5301332" "5506968" "5729700" "5774881" "5784696" "5950171" "6463383" "5819237" "4345117" "5670163" "5724524" "5787433" "5857708" "5866797" "5912696" "5918209" "6067044" "6415271" "6185543" "5657988" "6112188").pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 12:31

-	102	("6102961" "5934674" "5983205" "6182067" "4320975" "4436103" "5321795" "5383123" "5802859" "6061691" "6061691" "6141977" "6253189" "6415268" "5640569" "6292830" "4322134" "4420814" "4591907" "4782258" "5215068" "5237621" "5278644" "5537670" "5592077" "5715366" "5953440" "6047038" "6088661" "6088470" "6284022" "6376095" "6403698" "6426072" "6428884" "6433835" "5333226" "5339445" "5361390" "5499289" "5602596" "5680619" "5758068" "5850516" "5878431" "5930342" "6148291" "6169793" "6212280" "6212280").pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 12:58
-	10803	((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 16:50
-	0	(("6321212" "6321205" "6393406").pn.) and (upload or uploading)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 13:00

-	3	((("6321212" "6321205" "6393406").pn.) and (server)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 14:35
-	0	((("6321212" "6321205" "6393406").pn.) and (load)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 13:08
-	2682	((((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (load or upload or uploading)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/14 09:31
-	66	(((((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (load or upload or uploading)) and valuation	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 13:25
-	0	(((((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (load or upload or uploading)) and valuation and equipment	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 13:25
-	28	(((((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (load or upload or uploading)) and valuation and equipment	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 13:25
-	940	((("6321212" "6321205" "6393406").pn.) and (residual near5 value) or (realizable near5 value) or (liquidation near5 value) or (purchase near5 option)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 14:38
-	2	((("6321212" "6321205" "6393406").pn.) and (residual near5 value)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 15:57

-	1	((("6321212" "6321205" "6393406").pn.) and profile	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 15:57
-	6	("6321212" "6321205" "6393406").pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 15:59
-	5	((("6321212" "6321205" "6393406").pn.) and (exception or trend or matrix)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 16:00
-	9	(((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (profile near5 information) and (analyz\$4 near profile)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:28
-	4	("6405204" "6411908").pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:29
-	0	(((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (exception near5 request) and trend and analyst	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:31
-	5	(((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (exception near5 request) and trend	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:33
-	26	(((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (exception near5 request)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:52

-	0	(exception near5 request) and valuation	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:53
-	746	(exception near5 request)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:54
-	51	((exception near5 request)) and trend	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:57
-	6	(trend adj analysis) and valuation	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:59
-	0	(trend adj analysis) and valuation and research	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 17:59
-	9	equipment and lease and valuation	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 18:14
-	2214	equipment and lease	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 18:15
-	176	equipment near5 lease	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 18:29
-	0	4551719.pn	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 18:29
-	2	4551719.pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 18:31
-	7495	equipment near5 value	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 18:33
-	1167	(equipment near5 value) and calculate	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 18:33
-	334	((equipment near5 value) and calculate) and (input near5 data)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 18:34
-	30	((equipment near5 value) and calculate) and (input near5 data)) and server	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 19:08
-	17	(lease near5 information) and (lease near5 term)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 19:22
-	2	(lease near5 information) and ((realizable near5 value) or (residual near5 value))	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 19:27
-	2	(lease near5 information) and ((realizable near5 value) or (purchase near5 option))	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 19:42

-	2	6393406.pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 19:52
-	2	6321205.pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/13 19:52
-	3	((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and asset and (valuation near5 request)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/14 09:39
-	4	((705/36) or (705/37) or (705/35) or (705/7) or (380/279) or (382/117) or (705/38) or (705/39) or (705/40) or (707/104.1) or (713/200) or (705/10) or (705/35) or (705/1) or (705/38) or (705/37) or (705/26) or (705/8) or (62/292) or (377/39) or (382/159) or (705/22) or (705/28) or (705/36) or (705/39) or (705/42) or (705/7) or (707/3) or (705/36) or (705/35) or (705/10) or (705/37) or (705/38) or (705/1) or (705/7) or (705/39) or (705/26) or (705/28) or (705/40) or (705/8) or (707/104.1) or (62/125) or (62/149) or (62/292) or (377/39) or (380/279) or (382/117) or (382/143) or (382/159) or (702/181) or (705/22) or (705/42) or (707/101) or (707/3) or (713/200)).CCLS.) and (valuation near5 request)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/14 09:40
-	2	5950169.pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/14 14:40
-	0	(residual adj value) and (base adj value) and (depreciation adj value) and cost	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/14 14:42
-	5	(residual near5 value) and (base near5 value) and (depreciation near5 value) and cost	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/14 14:43
-	1842	trends and alerts	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/15 10:06
-	0	(trends and alerts) and (asset adj valuation)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/15 10:07
-	0	(trends and alerts) and (asset near5 valuation)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/15 10:07
-	17	(trends and alerts) and (valuation)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/15 10:21
-	2	5950169.pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/15 10:59
-	2	6405204.pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/15 10:59

-	10	("5226496" "4956782" "4516209" "5230391" "3890492").pn.	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/20 14:17
-	1	((("5226496" "4956782" "4516209" "5230391" "3890492").pn.) and pan	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/20 15:15
-	4	((("5226496" "4956782" "4516209" "5230391" "3890492").pn.) and cell	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/20 15:38
-	2	((("5226496" "4956782" "4516209" "5230391" "3890492").pn.) and gravity	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/20 18:00
-	0	((("5226496" "4956782" "4516209" "5230391" "3890492").pn.) and (assigning adj weight)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/20 18:01
-	0	("5226496" "4956782" "4516209" "5230391" "3890492").pn. and (assigning near5 weight)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/20 18:02
-	0	("5226496" "4956782" "4516209" "5230391" "3890492").pn. and (assigning and weight)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/20 18:02
-	2	("5226496" "4956782" "4516209" "5230391" "3890492").pn. and (assign\$4 and weight)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/20 18:02
-	807	(conveyor adj belt) and controller and (reverse or backward) and forward	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 11:04
-	0	(conveyor adj belt) and controller and (reverse or backward) and forward and (switchable near5 direction)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 11:06
-	776	(conveyor adj belt) and controller and (reverse or backward) and forward and (direction)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 11:07
-	17	(conveyor adj belt) and controller and (reverse or backward) and forward and (direction) and switchable	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 11:21
-	317	((conveyor adj belt) near5 (reverse or backward)) and forward	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 11:22
-	13	((conveyor adj belt) near5 (reverse or backward)) near5 forward) and controller	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 11:23
-	111	((conveyor adj belt) near5 (reverse or backward)) near5 forward)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 16:57
-	6	(glide adj coating) and plastic	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 17:00
-	0	(glide adj coating) near5 plastic	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 17:00

-	4	(glide near5 coating) near5 plastic	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 17:05
-	88	(glide near5 coating)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 17:11
-	50879	(plastic near5 coating)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 17:11
-	13032	(plastic adj coating)	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 17:11
-	45	(plastic adj coating) and glide	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/21 17:11
-	2997	(speed near5 sensor) and encoder	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/26 11:08
-	1213	(speed adj sensor) and encoder	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/26 11:08
-	25	(speed adj sensor) adj encoder	USPAT; EPO; JPO; DERWENT; IBM_TDB	2002/11/26 11:09

HEALTHAB is set ON as an alias for 5,73,155,34,434,74,42.
TRANSFT is set ON as an alias for 80,637.
TRANSAB is set ON as an alias for 108,6,63.
ADVERTFT is set ON as an alias for 635,570,PAPERSMJ,PAPERSEU.
INVENFT is set ON as an alias for 8,2,14,94,6,34,434,7.
SHOPFT is set ON as an alias for 635,47,570,PAPERS.
BANKFT is set ON as an alias for 625,268,626,267.
BANKAB is set ON as an alias for 139.
INSURFT is set ON as an alias for 625,637.
INSURAB is set ON as an alias for 169.

* **

**

SYSTEM:HOME

Cost is in DialUnits

Menu System II: D2 version 1.7.8 term=ASCII

*** DIALOG HOMEBASE(SM) Main Menu ***

Information:

1. Announcements (new files, reloads, etc.)
2. Database, Rates, & Command Descriptions
3. Help in Choosing Databases for Your Topic
4. Customer Services (telephone assistance, training, seminars, etc.)
5. Product Descriptions

Connections:

6. DIALOG(R) Document Delivery
7. Data Star(R)

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/H = Help

/L = Logoff

/NOMENU = Command Mode

Enter an option number to view information or to connect to an online service. Enter a BEGIN command plus a file number to search a database (e.g., B1 for ERIC).

?b 148

26nov02 12:58:52 User267117 Session D81.1
\$0.00 0.184 DialUnits FileHomeBase
\$0.00 Estimated cost FileHomeBase
\$0.04 TELNET
\$0.04 Estimated cost this search
\$0.04 Estimated total session cost 0.184 DialUnits

File 148:Gale Group Trade & Industry DB 1976-2002/Nov 26

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***File 148: Alert feature enhanced for multiple files, duplicate removal, customized scheduling. See HELP ALERT.**

Set Items Description

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?t 07250662/7

07250662/7

DIALOG(R)File 148:Gale Group Trade & Industry DB

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07250662 SUPPLIER NUMBER: 15379973 (THIS IS THE FULL TEXT)

Dynamic weighing: a look at what in-motion weighing is all about. (Reports on Checkweighing)

Herrle, Harald L.

Canadian Packaging, v47, n3, p24(1)

March, 1994

TEXT:

RECENTLY, THERE HAS been considerable interest in a new form of weighing, namely the dynamic or the in-motion form. High production speeds and automation commanded that the old ways needed to be adapted. But, there is confusion of what in-motion weighing really entails. Traditionally, weighing of any commodity was done statically. There was a scale, a concoction of break-down levers, which pulled on an indicator and when it stopped, we read on the graduated chart what the weight was. Or, even simpler, a beam moved up and when we pushed and added counterweights until the beam was level again, we calculated the weight. But, all this was time and labor consuming, and not only in the manufacturing of these devices.

The advent of electronics precipitated a revolution in the very traditional and specialized scale industry. All these fine-mechanical parts--levers, pivots, bearings, springs, etc.--were dismissed (and a lot of experience too). Scales became a cheap commodity. Loadcells and indicators are so freely available today that almost anyone can manufacture an electronic scale.

Perhaps the word 'weight' should be more narrowly defined. Most of us know that it is a power, namely the attraction our globe has on any mass. If you go to the moon, you will weigh 1/6 of your weight on earth and the moon is 1/6 of the earth's size. But the measurement of weight is also a basic need required in trade. With it, we can buy/sell commodities, distinguish between, sort and track products, measure performance, etc. However, any power can be sidetracked by another working on it in a different direction--remember the wind buffeting your car? So what are we doing when we weigh products on the fly?

Well, weight is actually the measurement of the acceleration of mass towards the earth's centre and, as long as this force is steady, the measurement is consistent. That means the measurement is correct either if the mass is static or moves at a constant speed. The examination of the terms--motion is movement in any direction and in-motion could mean gyration; dynamic refers to a constant condition--it tells us what we need in order to build a dynamic scale: a conveyor, a scale and an indicator. Sounds easy! But what are the basics?

The hardware: Since this is an automatic process, the products must come indexed so that only one is on the scale at a time. The indicator needs a command to start weighing (usually a photocell), and a certain amount of time to establish the weight. Therefore:

length of scale conveyor = length of longest product + (min. weighing cycle x speed of conveyor).

The conveyor should not induce disturbing influences and must be fully balanced, usually to half a scale graduation. The distance between platform and conveyor should be kept to a minimum to avoid cantilever effect.

The choice of scale is determined by length and weighing time: Single loadcell configurations limit the size of package as the loadpoint is small. Three or four loadcell configurations limit the accuracy as only a small portion of the loadcell capacity is used. Mechanical platforms with single loadcells allow full use of loadcell capacity and increase accuracy. They increase speed and accuracy limits astonishingly with high-speed, supersensitive loadcells (magnetic force restoration with 1/million resolution and extremely short cycle time). The choice of indicator includes high-internal resolution, weight sampling of 35 times/second minimum, 32-bit internal and 16-bit external busspeeds. But practice has proven that all this is not enough.

The firmware: In a normal, static, electronic scale, the weight is displayed after the platform has settled and, with appropriate damping, a number of same weight samplings have been recorded. Multiple samples are necessary, because the actual weight still oscillates after settling due to the influence of other environmental factors. But the weight reading is not averaging, the settled weight still moves up and down, however, within the same tolerance span. The indicator calculates the median between the

tolerance limits, and that is the weight displayed.

This simple program cannot be used in dynamic weighing as the environmental factors (i.e. draft; conveyor/product frequency or vibration) produce oscillations within wide limits, and frequent spikes distort the final reading. Heavy damping (slow-down of the electronically perceived scale movement) lets the perceived weight curve creep to the actual value thereby increasing cycle time. Electronic filters, however, remove spikes and, with prudently applied damping, achieve fairly true readings. Practice has shown that this passive method is not sufficient to achieve legal tolerances with larger packages. So let's take a more pro-active stance.

The upward flank of the weight curve is of no interest. But as that flank flattens, we apply heavy damping and filtering. As the curve flattens completely, we apply our tolerances, calculate the median and discard all samples outside the limits. If this calculation is reworked continuously, we sensitize our indicator to perceive real load changes despite the damping and filtering. Doing this within a prescribed time limit adapts our scale to nearly all circumstances.

There are products, however, with internal movements. A consecutive approach helps; should we not achieve a true weight, we simply accumulate all samples within the pre-calculated tolerances in infinite improvement filters and average those. That safety device has shown to be the clincher. In our total cycle time, we set a retro-active second control time and we finish on time.

Environmental factors: Environmental influences distort: so remove fans, shuddering machinery etc. from the vicinity of the scale, keep the product from moving in other than the wanted direction.

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